

Name _____

Chapter 4 Study Guide

What were the two things wrong with Rutherford's model of the atom?

How is electromagnetic radiation (light) transmitted? What is the speed of all electromagnetic radiation?

Define wavelength and frequency. How are they related to each other?

Briefly describe what Max Planck did in his research. What was his big conclusion on how energy behaves.

Define quantum(a) and photons.

Describe Neils Bohr's hydrogen atom in detail and how the electron behaves when energy is added to the atom.

Define excited state and ground state.

Why was Bohr's model wrong?

What did Louis deBroglie think about the electron's behavior and how did he prove this?

What was deBroglie's big statement on about how matter relates to energy? (hint: opposite of Planck's)

Explain the following statement, "Electrons have a dual-wave particle nature."

What are Schrodinger and Heisenberg's contributions to the quantum model?

In the quantum model, what is an orbital? What kind of orbitals have we worked with? How many electrons do they hold and what are their shapes?

What are the principle and angular momentum quantum numbers?

Define Aufbau principle.

Define Hund's rule.

Define Pauli-Exclusion principle.

In the quantum model, can we precisely know the exact location of an electron in the quantum model?

What are the electrons in the outermost energy level called? Which orbitals are these electrons found in?
What is the maximum number of these electrons an element can have?

For the elements below, provide the:

electron configuration notation

orbital notation

electron dot notation

Be

O

Cl

Ca²⁺